SCIENTIFIC SERIALS

THE current number of the *Journal of Anatomy and Physiology* contains much valuable scientific work, together with its excellent Reports on the progress of Anatomy and Physiology, by Prof. Turner and Dr. Stirling. The first paper is one on the freezing process for section-cutting, and on various methods of staining and mounting sections, by Mr. Lawson Tait. The author prefers the non-employment of chromic acid, picric acid, and other chemically-interfering agents. His section-cutter is a modification of Stirling's, a freezing tank of considerable size being added. The air-bubbles are removed from the sections by the action of boiled water. Logwood and litmus are preferred as staining agents, and their operation is given in proof of the nuclei of cells being, contrary to ordinary ideas, alkaline.—Prof. Flower, in a note on the construction and and arrangement of anatomical museums, makes several very valuable suggestions, which should be specially studied by those who have anything to do with the establishment and construction of biological museums. He shows how that in lofty rooms, with galleries, lighted at the ceiling-wall junction, the preparations have to be arranged according to their manner of preservation; dry, in bottles, and otherwise; which involves the separation of those illustrating any single subject. A series of small side-lighted rooms allows of all the specimens illustrating any single subject, however preserved, being placed in juxtaposition, whilst it separates off the subjects.—Dr. Hollis remarks, with several interesting historical references, on lopsided generation.—The next paper is by Mr. Walter Pye, entitled observations on the development and structure of the kidney. The relation of the capsule to the Malpighian tuft is explained upon the peculiarities observed in the developing organ in a manner differing from the results of Riedel. The characters of the ascending limbs of Henle's loops are described in detail. A plate accompanies the paper.—Mr. Lowne, in a note on the mechanical work of respiration, desires to prove that the amount of work performed in the respiratory act is much less than is usually stated, from calculations based on the relation between the velocity of moving gases and the pressure producing motion.—Dr. Howden describes a case of atrophy of the right hemisphere of the cerebrum attended with the same condition of the left side of the cerebellum and the left side of the body, in a woman aged 30.—Prof. Turner figures and describes the Spiny Shark (*Echinorhinus spinosus*) from a specimen captured near Bass Rock, six-and-a-half feet long. The ureters were found to open into the cloaca by a single orifice. There was no cement gland in the oviduct, from which it is evident that the ova have no horny case. The stomach is succeeded by a pyloric tube; pyloric cæca are absent. In comparing *Læmargus* and *Echinorhinus*, which are supposed to be closely related, it is found that the former possesses two large duodenal cæca and no oviducts, whilst in the latter cæca are absent and oviducts developed. Prof. Turner also proves, from a specimen caught off the mouth of the Frith of Forth, that the Postbeagle Shark (*Lamna cornubica*) possesses a spiracle, contrary to the opinion of most authorities.—Mr. D. J. Cunningham gives notes on the Great Splanchnic Ganglion. In twenty-six cases, he failed to detect its presence in six; it is situated on the body of the twelfth dorsal vertebra; it is variable in shape and size. The same author describes a case of lateral curvature of the spine in connection with hypertrophy of the sympathetic nervous system in the lumbar and sacral regions.—Mr. Dwight makes remarks on the position of the femur and on its so-called "true neck."—Drs. Kronecker and Stirling describe in detail experiments on the characteristic sign of cardiac muscular movement. The fundamental fact on which the investigation is based is the law of Bowditch, that "the induction current of the weakest strength which produces a contraction of the heart does not produce the weakest of possible contractions." The fact that after a pulsation has been developed in the heart of a frog, by a certain stimulation, the organ can be made to continue its beating with a diminished stimulus, is compared to the difference between the effort first required to sound a big bell and that necessary to maintain it ringing. The effect of temperature on the cardiac irritability is shown, the heart reaching its maximum mobility at 25° C. After the discussion of the difficult phenomenon of cardiac tetanus, the authors prove that "the cardiac muscles can only act equally with the help of continually new nutrient fluid." The paper is deserving of the attention of all physiologists.—Dr. Kronecker also describes a new digestion-oven with a diffusion apparatus.—Mr. J. C. Ewart has a note on a large organised cyst in the subdural space.—Mr. J. Reoch writes on the decomposition of urea, adducing evidence to show that in urine the urea is changed into carbonate of ammonia by the action of a fungus the germs of which are contained in the atmosphere.—Mr. M. Simpson describes the existence of two precaval veins in a dog, a condition constant in the kangaroo and some other animals.

Report of the Rugby School Natural History Society for the Year 1874.—We are glad to be able to say that this Report is a satisfactory one; all the sections have done a fair quantity of good work, and a large proportion of the papers read has been the work of actual members or associates. The papers are all highly creditable to the authors, and many of them give evidence of well-trained powers of observation. Mr. J. M. Wilson contributes three interesting papers. One, "On the construction of a geological model of the neighbourhood of Rugby," contains some queries and suggestions as to how such a work should be gone about, and we are glad to see that the model has actually been commenced and has already made considerable progress. This is really most profitable work on which to employ the members of the Society. Other papers by Mr. Wilson are, "On the companion of Sirius," a note of an observation on the *comes* of Sirius, from which Mr. Wilson infers that it has performed twenty-three degrees of its revolution in ten years; and "On the Geology of Hillmorton." The following titles of papers by members will give an idea of the work done by the Society:—"On Mounting for the Microscope," by E. J. Power; "On the Will-o'-the-Wisp," by H. W. Trott; "On Owls," by H. Vicars; "On the Sub-Wealden Explorations," by R. D. Oldham; "On an Entomological Expedition," by H. F. Wilson, who also contributes a paper "On the Great Spotted Woodpecker;" "On Migrations," by W. C. Marshall; "On Bees," by H. Vicars; "On Roman Remains near Church Lawford," by L. Knowles; "On Drops of Liquid," by H. F. Newall, a very interesting paper, giving evidence of some faculty for original research; "On Cuckoos," by W. Larden. Mr. Newall's paper on drops is illustrated by some carefully executed drawings. The same member has constructed an ingenious compound pendulum machine, an illustration of which is given, as also illustrations of some most delicate curves executed by the machine. Among other illustrations we may mention a heliotype copy of a drawing by J. H. Patry of fifteen various observations of the planet Mars, taken at the Temple Observatory. Very full sectional reports are appended, and under the head of "Statistics" a variety of information is given. Altogether this is one of the most satisfactory reports published by this Society.

Zeitschrift der Oesterreichischen Gesellschaft für Meteorologie, April 15.—This number contains an article by Prof. Buys-Ballot on the climate of Buenos Ayres, and another on the hailstones which have occurred in Würtemberg during the forty-six years 1828–73.

Bulletin de l'Académie Royale des Sciences de Belgique, 2 ser. t. xxxix. No. 3.—This number contains a note on *Pecopteris odontopteroides* (Morris), by M. François Crépin. There is a fossil from the coal measures of Hobart Town among those sent by Mr. Allport to the museum, which M. Crépin refers to the same species as that named by Prof. Morris. He doubts, however, whether Prof. Morris has assigned his specimen to its true relationships, believes it is nearer to *Odontopteris alpina* (Gein), and provisionally proposes *Odontopteris Morisii* as its name.—On the *calcaire carbonifère* between Tournai and the environs of Namur, by M. E. Dupont; a description of forty-seven pages, with two coloured folding plates of sections.—Researches on the structure of the corda dorsalis of Amphioxus, by M. Camille Moreau. The work was carried on in the microscopical laboratory of the University of Liége, under the direction of Prof. E. Van Beneden. The paper consists of a description with a plate. To complete the working out of the homologues of the layers, further embryological observations, M. Moreau says, are necessary.—No. 4. The communications in this number are:—Note on the temperature of the winter of 1874–75, by M. Quetelet. The winter is compared with that of 1859–60, and a table showing the resemblance is given.—Note on the halo with mock moons of March 23, 1875, by M. Chas. Hooreman.—On the theory of the use of hot air in furnaces, by M. H. Valérius.—On some fossil plants from the "Psammites du Condroz," by M. A. Gilkinet. This paper is partly of criticism on the work of M. Crépin, and is partly descriptive. Three folding plates of illustrations are given.

Archives des Sciences Physiques et Naturelles, vol. 52, No. 207 (March 15, 1875).—This part contains many papers trans-

lated and reprinted from other serials, besides several original ones. We note the following :—On the fossil vertebrata of the State of Nebraska, by M. Delafontaine. On the measurement of altitudes in Switzerland, executed by MM. Hirsch and Plantamour. On the action of galvanic currents upon alloys or amalgama, by M. Eugène Obach. On some experiments with Holtz's machine, by F. Rossetti. Researches on the spectrum of chlorophyll, by J. Chautard.

SOCIETIES AND ACADEMIES

LONDON

Linnean Society, June 3.—Dr. G. J. Allman, F.R.S., president, in the chair.—The President nominated the following gentlemen as Vice-presidents for the ensuing year, viz. :—Mr. G. Bentham, F.R.S. ; Mr. G. Busk, F.R.S. ; Dr. J. G. Jeffreys, F.R.S. ; and Dr. J. D. Hooker, P.R.S.—Prof. Thiselton Dyer exhibited, under the microscope, some specimens of the very rare Alga *Stephanosphæra pluvialis*, known to occur only in a single locality in Britain, a pool on Bray Head, in Ireland.—Dr. Trimen exhibited specimens of two recent additions to the British flora, *Zannichellia polycarpa*, found by Dr. Boswell-Syme in the Orkney Islands in 1847, and *Carex ornithopoda*, discovered by two working men in Derbyshire.—Mr. Pascoe exhibited a very fine collection of Crustacea from the Bay of Naples. The following papers were then read :—On the Barringtoniaceæ, by J. Miers, F.R.S. The purpose of this paper is to show that the Barringtoniaceæ constitute a distinct order, forming an extremely natural group with peculiar and uniform characters, differing from the Myrtaceæ in their alternate leaves without pellucid dots, and in the nature of their inflorescence and fruit. They are trees, frequently of large size, rarely low shrubs, all delighting in running streams, some growing in estuaries or along the sea-shore. The author describes the characters of the order in considerable detail, and gives the diagnosis—in many cases redrawn from actual examination—of each genus and species. The number of genera he makes to be ten. The paper was accompanied with drawings illustrating the floral and carpological characters of each genus.—Note on the occurrence of fairy rings, by Dr. J. H. Gilbert, F.R.S. This paper was founded on the observations made by the author and Mr. Lawes on their experimental plots at Rothamstead. After some particulars as to the effect of different manures in varying the proportion of different kinds of vegetation in permanent pasture, especially grasses and Leguminosæ, the author suggests that the determination of the source of the nitrogen in the fungi that constitute the fairy rings which frequently make their appearance on the plots would throw some light on the much-disputed question of the source of the nitrogen of the Leguminosæ. It is remarkable that although, according to published analyses of various fungi, from one-fourth to one-third of their dry substance consists of albuminoids or nitrogenous matter, and 8 to 10 per cent. of mineral matters or ash, of which about 80 per cent. is potassium phosphate; yet the fungi develop into "fairy rings" only on the plots poorest in nitrogen and poorest in potash. The questions which appear still to require solution are these :—(1) Is the greater prevalence of fungi under such circumstances due to the manurial conditions themselves being directly favourable to their growth? or (2) Are the lower orders of plants—in consequence of other plants and especially grasses growing so sluggishly under such conditions—better able to overcome the competition and to assert themselves? (3) Do the fungi prevail simply in virtue of the absence of adverse and vigorous competition, or to a greater or less extent as parasites, and so at the expense of the sluggish underground growth of the plants in association with them? or (4) Have these plants the power of assimilating nitrogen in some form from the atmosphere ; or in some form or condition of distribution within the soil, not available, at least when in competition, to the plants growing in association with them?—On a possibly wild form of *Hibiscus Rosa-sinensis*, by Prof. Oliver, F.R.S.

Mathematical Society, June 10.—Prof. H. J. S. Smith, F.R.S., president, in the chair.—Prof. Cayley, F.R.S., made a brief communication on some figures of curves in 3-bar motion. —Prof. Sylvester, F.R.S., spoke on "James Watt's parallel motion," and on an apparatus for regulating the motion of a train of prisms.—Mr. T. Cotterill read a paper on the correspondence of points collinear with a fixed origin. In the paper S and T are taken homogeneous functions of any number of variables (say three, $x\ y\ z$): the degree of S being one lower than that of T, and are supposed to be connected with another set, $x'\ y'\ z'$, of the same number of variables by the equations $\frac{x'}{x} = \frac{y'}{y} = \frac{z'S}{T}$. If the variables $x\ y\ z$, $x'\ y'\ z'$, denote the co-ordinates of two points in a plane, a correspondence is established between them depending on the forms of S and T. The object of the paper is to explain the relations between the corresponding curves and to give examples.

Physical Society, June 12.—Prof. Gladstone, F.R.S., president, in the chair.—Lord Lindsay, Sir W. Thomson, and Prof. Sylvester were elected members.—Mr. Wildman Whitehouse described some experiments he had made on the electric conductivity of glass. He employed pieces of thermometer tube about an inch in length, into the bore of which two platinum wires were inserted in such a manner that there was an interval between the points. In some cases one wire of platinum occupied the entire bore of the tube, and this tube was surrounded on its external surface by a helix of wire of the same metal. In each case the arrangement was introduced into a circuit in which were also placed a Thomson galvanometer and a set of resistance coils. It was shown that at the ordinary temperature there was no deflection, but that the current passed freely when the glass was heated to redness. The difficulty of making contact with the glass led Mr. Whitehouse to use two test-tubes, one inside the other, both containing mercury, with which wires of platinum freely communicated. The flame of a Bunsen burner was applied to the outer test-tube and the temperature of the metal noted by the aid of a thermometer. In one series of experiments the diameter of the internal tube was $\frac{5}{8}$ inch, the length in contact with the mercury about $3\frac{3}{4}$ inches, and the thickness of the glass $\frac{1}{10}$th of an inch. A current was first observed to pass at 100° C., and, as the temperature rose, the amount of deflection increased. The following are approximate measurements of the resistance of the glass at different temperatures :—

At 165° C.	Resistance	=	229,500	Ohmads
,, 185 ,,	,,	=	100,000	,,
,, 210 ,,	,,	=	69,000	,,
,, 255 ,,	,,	=	22,500	,,
,, 270 ,,	,,	=	9,000	,,
,, 300 ,,	,,	=	6,800	,,

Prof. Gladstone drew attention to the necessity for ascertaining the nature and composition of the glass.—Prof. Guthrie alluded to the fact that electricity of high tension is freely conducted by glass at a red heat. He also asked whether, as the temperature was raised, a point was reached at which the conductivity began to decrease.—Prof. M'Leod pointed out that the thermometer tubes used by Mr. Whitehouse were of lead glass, and that the lead had in most cases been reduced by exposure to the flame of the Bunsen burner, and he urged that these facts should not be overlooked in measuring the resistances. He stated that lead glass is better than other kinds of glass for insulation.—Prof. G. C. Foster asked whether an increased capacity due to the heating might not introduce an error into the measurements of resistance. Mr. Whitehouse replied that he had only recently commenced the experiments, and promised that the suggestions which had been made should receive due attention.—The President then read a paper on the time required for double decomposition of salts. It is well known that if, on mixing solutions of two salts, MR and $M'R'$, an insoluble body can be produced by an interchange of metals and radicals, that body is produced to the fullest extent possible. The only explanation of this fact which has been given is founded on the theory of Bertholet, that in all cases of mixture there is a redistribution of the constituents according to their relative affinity and mass, with the production of more or less MR' and $M'R$. Now, if one of these, say MR', be insoluble, it will remove itself at once from the sphere of action, but this will necessitate a fresh distribution of the constituents with the production of more insoluble salt, and so on until the whole of the M has entered into combination with R'. Dr. Gladstone commenced this research twenty years ago, and added in a note to a paper in the Phil. Trans. : "It is easily conceivable that when the affinity for each other of the two substances that produce the insoluble compound is very weak, the action may last some time and become evident to our senses. Is not this actually the case when sulphate of lime in solution is added to nitrate of strontia, or carbonate of soda to chloride of calcium, or an alkaline carbonate to tartrate of yttria, or oxalate of